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Informal Loan Demand and Repayment Potential of Farmers in Ohafia Local Government Area of Abia State, Nigeria

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Abstract

The study analyzed informal loan demand and repayment potential of farmers in Ohafia Local Government Area of Abia State with specific focus to: describe socio-economic characteristics of farmers who procure loan from informal financial sources; examine amount of credit demanded by farmers, vis-à-vis disbursement and repayment in informal credit institutions; determine factors influencing informal loan repayment in the study area; determine loan repayment potentials of farmers; identify problems encountered by farmers in their demand for informal credit. Multistage random sampling technique was adopted in the selection of 120 informal farmer borrowers from whom data were elicited using semi structured and pretested questionnaire. Analysis of data was done using descriptive statistics, ordinary least square (OLS) multiple regression analysis and discriminant function analysis. The first result of the OLS multiple regression analysis showed that amount of informal credit demanded was significantly influenced by years of borrowing, interest rate, household size and age. The second OLS multiple regression analysis result revealed that amount of informal loan repaid was significantly influenced by gender, distance between home and source of credit, household size, interest rate and farm income. The result of the discriminant function analysis revealed that education, farming experience, farm income, distance between home and loan source, gender and farm size made positive contribution to the total discriminant score, while, age, loan period and amount borrowed contributed negatively. It was observed that majority (85.0%) of the farmers faced problem of high interest rate as a constraint to informal credit demand in the study area. The study recommended that the problem of high interest rate of informal credit institutions should be addressed by the government. This will enable the indigent farmers to access and patronize informal credit institutions available to them.

Keywords

Informal Credit, Loan Demand, Loan Repayment, Repayment Potential, Farmers

1. Introduction

Agriculture in Nigeria is characterized by a multitude of small scale farmers scattered over wide expanse of land area, with small holding ranging from 0.05 to 3.0 hectares per farm land. This is amidst rudimentary farming systems, use of crude tools, low capitalization and low yield per hectare [1], leading to gross inadequacy of food supply. The food problem has been heightened by the relatively unavailability and low level of productive resources used by farmers in the country, a condition that is particularly worsened by poor use and unavailability of credit. In Nigeria, empirical evidence has established a positive link between the declining agricultural productivity and limited credit facilities [2, 3]. This situation threatens the capacity of farmers in their quest for sustainable production.

In Nigeria there are two major sources of credit: formal and informal credit sources. Most farmers are usually not eligible for formal credit due to lack of collateral security. Therefore they cannot take advantage of it to obtain credit to finance the inputs needed for improved land management and productivity. Many farmers in Nigeria are therefore forced to meet both consumption and input needs by borrowing from informal credit sources, often at much higher rates of interest [4]. Informal financial associations have become a major

channel of borrowing to farm households in Nigeria. This is attributed to the relative ease of obtaining credit devoid of collaterals such as land and other productive assets which most of the rural farm household lack access to [5]. Credit availability to agriculture is justified when farmers are faced with low savings capacity, poorly developed rural financial markets and limited availability of appropriate farm technologies whose adoption is constrained by shortage of funds [3].

The demand for credit has increased as a result of increased economic activities in the informal sector [6]. This informs why farm credit has become a critical factor in modeling the growth of agricultural productivity and the development of the rural economy, which consists mainly of agriculturally based economic activities [7]. The nature and operation of the formal credit sources have failed not only to deliver credit to a larger proportion of the farmers but also, to promote a viable delivery system. This has caused an increase in the patronage of informal credit sources by farmers and other entrepreneurs [8, 9, 10].

Given that majority of farmers in Nigeria lack access to formal credit; it is not surprising that informal credit is the major source of loans for the farmers. It is highly recognized that most of the informal loans are demanded and subsequently used for agricultural purposes. Informal credit sources are unquestionably the most popular sources of finance to the rural and even urban farm households [11], because the formal credit sources have scared many farmers due to the encumbrances surrounding its use [10]. Unregulated money supply, easy accessibility, easy liquidity and low administrative bottlenecks, collateral free lending, proximity, timely delivery and flexibility in loan transaction are some of the attractive features of informal credit sources to the farmers [12]. [13] further pointed out that the common elements which run through informal credit arrangements is their informality, easy accessibility, loan availability in very small size and for short periods, low administrative and information costs, little or no collateral, flexible and variable interest rates, adaptability, highly flexible transactions, repayments tailored to individual needs and flexible options. All this reduces their transaction cost and gives them comparative advantage and economic rationale over formal finances and attracts farmers to borrow from informal financial sector.

The income streams of farm households in Nigeria are micro-scale operation. The small scope of the farming and other related jobs is the result of low capitalization; low capitalized investment generates low income. And because of low income, savings is small, since it is only money saved that can be invested; low savings leads to low investment, hence the farmers need to borrow to augment available capital. Low financial resources, apart from restraining rural households from moving across the entrepreneurial capital threshold, tends to exclude those with insufficient funds at their disposal from starting business [14]. The urgent need of additional funds to meet pressing needs or honour immediate obligation has often necessitated borrowing. Thus, loan is the result of scarcity of money in relation to its demand [15, 16].

Credit repayment has been a persistent bottleneck in Nigeria over the years. There have been reported cases of high default rates [17, 18]. Delinquency in repayment has been traced to inadequate incomes, sudden price decline, weak infrastructure, inadequate markets, natural hazards, misapplication and illiteracy [17, 19]. The flexibility built into loan disbursement and repayment in informal credit sector has resulted to increased loan delinquency and default among rural farm household borrowers. This sometimes results to loan diversion to non-agricultural and non-productive use of credit by borrowers. This is largely as a result of many loopholes in the informal agricultural credit system such as inadequate monitoring and evaluation, and ineffective policies which have not adequately complemented the use of agricultural credit, hence, an alarming increase in default rate [20].

Loans from informal credit sources (which include relations, friends, merchants and money lenders) are usually made directly to the borrowers by the lender. They are prevalent in areas where individuals are quite familiar with and share confidence in one another. The relative ease of obtaining loans and flexibility built into repayment has made non-institutional sources extremely popular among rural farmers [21]. Despite the popularity and flexibility, [20] noted that the informal financial agents tend to be small and proprietary in size, confine activities to small neighborhoods, and restrict activities to only well-known people in order to avoid default, thus, can only cater for a limited number of trusted clients. The volume of lending is very small and may not meet the needs of the borrower. Many of the loans from money lenders, middlemen, landlords and merchants are at exceedingly high rates of interest. It is not uncommon for farmers to pledge their economic trees like cocoa, kolanut, rubber, oil palm and even entire farmlands as collateral for money borrowed from money lenders. Rural farm borrowers find it difficult to adopt a third party guarantee as a technique of overcoming problem of collateral.

The negative experiences faced by farmers in the formal financial market have brought about a renewed interest in the operations of the informal financial market and its place in the mobilization and allocation of funds [14]. An understanding of the borrowing and repayment behavior of the farmers is critical for designing financial products and systems that can efficiently address their demand for financial services. The broad objective of this study is to analyze the informal loan demand and repayment potential of farmers in Ohafia Local Government Area of Abia State, Nigeria. Specifically the study intends to: (i) describe socio-economic characteristics of farmers who procure loan from informal financial sources in the study area; (ii) examine amount of credit demanded by farmers, vis-à-vis disbursement and repayment in informal credit institutions; (iii) determine factors influencing informal loan demand by farmers in the study area; (iv) determine factors influencing informal loan repayment in the study area; (v) determine loan repayment potentials of the borrowers in the study area and

(vi) identify problems encountered by farmers in their demand for informal credit.

2. Research Methodology

2.1. Study Area

The study was conducted in Ohafia Local Government Area (LGA) of Abia State, Nigeria. Most of the farm households in the LGA depend on informal sources for farm financing, hence the choice of the study area is well justified. The LGA lies between latitudes 5°30´N and 5°45´North of the Equator and longitudes 7°45´E and 7°55´East of the Greenwich Meridian. Ohafia LGA was created on August 27, 1991. Ohafia LGA is bounded by Cross River state at the western border; Arochukwu LGA at the North; Bende LGA to the East and Isuikwuato LGA at the south. The LGA occupies an area of about 438 square kilometers and has a population of about 245,987 persons with a relatively high density of 580 persons per square kilometer [22].

Ohafia Local Government Area is made up of eight autonomous communities with three major clans namely; Ohafia, Nkporo and Abiriba. Agriculture is the dominant economic activity and main source of employment in the area providing employment and income for more than 60.0 per cent of the population. The people are predominantly farmers and have the potentials for high production of agricultural produce and products such as palm oil, cassava, vegetables, palm kernel, yam, etc. and also engage in food processing [23].

The Local Government Area has vast number of informal financial organizations which include but not limited to the following; local money lenders, Rotating Saving and Credit Associations (ROSCA), mobile bankers (Akawo collectors), Fixed savings and credit associations, Cooperative thrift and credit societies.

2.2. Sampling Technique

A multistage random sampling technique was used in this study for the purpose of collecting data. In the first stage, six autonomous communities were randomly selected from the eight autonomous communities in the Local Government. The second stage involved a random selection of two villages from each of the communities; this gave a total of twelve villages. From each of the chosen villages, a list of informal credit sources was obtained from the village secretaries who were the key informants. These formed the sampling frame for the informal credit association from which samples of two informal credit associations were randomly selected per village. In all a total of 24 informal credit associations were randomly selected for detailed study. Another list of farm households who had accessed informal credit was obtained from the selected informal credit groups in each village. These formed the sampling frame from which 5 farmer borrowers were randomly selected from each informal credit association, making a total of 120 informal borrowers.

2.3. Method of Data Collection

The study employed primary data for its analysis. The Primary data were elicited for by use of pre-tested and structured questionnaires. The data of interest includes: socioeconomic characteristics of the farmers; amount of credit demanded; amount repaid; loan disbursement categories; loan demand and repayment constraints among others.

2.4. Method of Data Analysis

In order to realize the purpose of the study, a number of statistical tools were employed in analyzing data obtained for the study. Descriptive statistics such as frequencies, means, tables and percentages were used to realize objective (i), (ii) and (vi). Multiple regression model was employed to analyze factors influencing informal loan demand (objective iii) and repayment (objective iv), while discriminant analysis was employed to determine loan repayment potentials of the borrowers (objective v).

2.5. Model Specification

The multiple regression model used to realize objective III, is implicitly stated as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, ei) \quad (1)$$

Where:

Y = Amount of informal loan borrowed (naira).

X_1 = disposable income (total amount of income earned in naira less tax)

X_2 = Household size (number of people feeding from the same pot)

X_3 = Level of education (number of years spent in school)

X_4 = Age of respondent (years)

X_5 = Duration of Loan (period fixed for loan repayment in months)

X_6 = Farm Size (hectares).

X_7 = interest rate (%)

Ui = Error term.

The multiple regression model used to analyse objective IV, is implicitly stated as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7 \ldots X_n, ei) \quad (2)$$

Y = Amount of informal loan repaid (Naira).

X_1 = Age (years)

X_2 = gender (1= male, 0=female)

X_3 = Educational level (schooling years)

X_4 = Farming experience (years)

X_5 = Distance between home and informal credit sector (km)

X_6 = Amount of loan obtained (₦)

X_7 = Farm size (hectare)

X_8 = Farm income (₦)

X_9 = Disbursement rate (%)

X_{10}= Household size (number)

X_{11}= Membership of farmers association (1=Yes, 0=No)

ei = error term

The four functional forms (linear, Exponential, Double log and semi log forms) were fitted with the data. The lead equation was selected based on statistical and econometric reasons such as number of significant variables, magnitude of the F-ratio and R^2, and the conformity of signs of the variables to *a priori* expectation.

The four functional forms are specified as follows:

Linear Form

$Y=bo+b_1X_1+b_2X_2+b_3X_3\ldots\ldots\ldots\ldots\ldots b_qX_q+ei$

Semi – logarithmic Form

$Y=bo+b_1LnX_1+b_2LnX_2+b_3LnX_3+\ldots\ldots\ldots\ldots b_qLnX_q+ei$

Exponential Form

$LnY=bo+b_1X_1+b_2X_2+b_3X_3+\ldots\ldots\ldots\ldots\ldots b_qX_q+ei$

Double – logarithmic Form

$LnY=bo+b_1LnX_1+b_2LnX_2+b_3LnX_3+\ldots\ldots\ldots\ldots b_qLnX_q+ei$

Objective (V) was analyzed using the discriminant analytical model. Discriminant function was used to differentiate the farmer borrowers into credit worthy and non-credit worthy based on the repayment rate. Using the loan repayment values as a basis for classification, farmer informal credit beneficiaries were classified into two groups; group 1 consisted of farmers who repaid at least 50% of the loan, whereas group 2 were the farmers who repaid less than 50% of the loan borrowed. Farmers in group 1 were assumed to have credit worthy potentials. The model classified the arable crop farmer beneficiaries into two groups following previous studies [24, 25, 26].

The model is presented explicitly as $D_i = b_0 + b_1Z_1 + b_2Z_2 \ldots\ldots b_nZ_n$ z, is derived by the formula

Where

Di= total discriminant score

z = is the individual discriminant score or the contribution of each independent variable of the discriminant score (Di)

Q_{ij} = the ith individual value of the ith independent variable

b_{ij} = the discriminant coefficients for the ith variable

Q = mean value of the independent variable

= standard deviation of the independent variable.

Individual score z, is a function of the independent variable;

$zi = b_o + biQ_{ij} + b_2\ Q_{2\,i} + \ldots + B_nQ_{ni}$

The classification procedure is as follows, if zi> z classified individual as belonging to group 1 credit worthy farmers and if zi< z classified individual as belonging to group 2 (non-credit worthy farmers) the classification boundary is the locus of point where $b_o + b_iQ_{ij} = b_zQ_{zi} + \ldots\ldots b_nQ_{ni}$ = z crit.

The independent variables used in the analysis are defined as,

X_1 = Age (years)

X_2 = Gender (1=male, 0=female)

X_3 = Educational level (years)

X_4 = Farming expenditure (Naira)

X_5 = Farm size (Hectare)

X_6 =Value of assets (Naira)

X_7 = Farming experience (years)

X_8 = Amount of loan borrowed (Naira)

X_9 = Distance between home and bank (Km)

X_{10} = off farm income (Naira)

X_{11} = farm income (Naira)

Discriminant function analysis is a descriptive technique, which belongs to the family of multivariate statistical techniques related to factor analysis. It is broken into a 2 – step process. The first step is test of significance of a set of discriminant functions using squared canonical correlation, Wilks' lambda and Chi-square statistics. The second step is the classification of the farmers into credit worthy and non-credit worthy based on the discriminating powers of the independent variables. Usually if the first step is statistically significant one proceeds to see which of the variables has significantly different means across the groups [24].

3. Results and Discussion

3.1. Socio Economic Characteristics of the Farmers

It is seen in Table 1 that 61.67% of the informal credit farmer borrowers are females while 38.33% of them are males. This indicates that female farmers in the study area demand informal credit more than the male farmers. This is in line with the findings of [27] that women patronized informal financial sources for credit acquisition than males because of their increased membership in informal credit association. Table 1 also shows that 36.67% of the farmers were within the age range of 41 and 50 years while 16.67% of them fall within the age bracket of 20-30 years. The mean age of the farmers is 44 years. This is an indication that the respondents in the study area were mostly middle aged farmers and within the active productive work force. This has implication on access to informal credit. These age-groups (41-50) are known to be entrepreneurial and economically active to explore new avenues for business opportunities [28]. Informal financial sector may be willing to disburse credit to active and productive farmers who can effectively shoulder the rigors and tedium involved in farm work [29].

In terms of marital status Table 1 shows that 21.67% of the respondents were single, while 78.33% of them were married. Table 1 also shows that 61.67% of the respondents had household size of between 5 and 9 members while 28.33% and 10.0% others had household sizes of between 1 and 4 and above 9 members respectively. The mean household size was 5 persons.

Table 1 also shows that 10% of the respondents had no formal education while 58.33% of them had secondary school education. In summary, 90% of the farmers had formal education. Literacy is an advantage in the procurement of informal credit from informal financial association. This may be because farmer borrowers that had formal education have better loan management tendency and also better tendency towards adopting new technology to enhance their productive activities. As expected, higher education would enhance improved technology adoption

hence increased farm income and greater ability to repay [30].

Table 1. *Socio-economic distribution of informal farmer borrowers in Ohafia Local Government Area of Abia State, Nigeria.*

Variables	Frequency	Percentages
Gender		
Male	46	38.33
Female	74	61.67
Age (years)		
21 – 30	20	16.67
31 – 40	24	20.00
41 – 50	44	36.67
51 – 60	18	15.00
61 and above	14	10.00
Mean = 44. 33		
Marital status		
Single	26	21.67
Married	94	78.33
Household size		
1-4	34	28.33
5-8	74	61.67
9 and above	12	10.00
Mean = 5.36		
Educational level		
No formal education	12	10.00
Primary education	35	29.17
Secondary education	70	58.33
Tertiary education	3	2.50
Total	120	100.00

Source: Field survey 2014

3.2. Loan Size

The distribution of the respondents according to the amount applied for, and amount received is shown in Table 2. The Table shows that a good proportion of the respondents (48.33%) applied for informal credit of between ₦81,000 and ₦100,000 while only (38.33%) of them were granted loans between ₦81,000 and ₦100,000. Also, a small proportion of the respondents (10.00%) received loans of below ₦20, 000. This result is an indication that the farmer's credit demand is far higher than the supply. However, it was revealed from the study that loanable funds were rationed among the numerous successful applicants due to gross shortage of loanable funds, hence the low size of individual loans.

Table 2. *Distribution of the Farmers according to the amount of Informal Credit applied for and amount received in Ohafia Local Government Area of Abia State, Nigeria.*

Size of loan	Amount applied for		Amount Received	
	Frequency	%	Frequency	%
≤20000	12	10.00	12	10.00
21000-40000	6	5.00	16	13.33
41000-60000	8	6.67	12	10.00
61000-80000	14	11.67	14	11.67
81000-100000	58	48.33	46	38.33
>100000	22	18.33	20	16.67
Total	120	100.00	120	100.00

Source; Field survey, 2014

3.3. Loan Repayment

The distribution of the respondents according to the amount repaid is shown in Table 3. The Table shows that a fairly good proportion of the respondents (31.67%) repaid informal loan amounts of between ₦81, 000 and ₦100, 000. Also, 31.67% of the farmers repaid amounts below ₦20,000. A fairly small proportion of the respondents (11.67%) repaid above ₦100,000. In summary, about 60.0% of the informal loan beneficiaries repaid amounts above ₦50, 000. This is an indication that the farmer's loan repayment potential is relatively high in the study area. This confirms the report of [31] that the repayment performance of borrowers in informal financial sectors is highly appreciable.

Table 3. *Distribution of the Farmers according to amount of Informal Credit repaid.*

Amount repaid	Frequency	Percentage
≤ 20000	38	31.67
21000-40000	6	5.00
41000-60000	16	13.33
61000-80000	8	6.67
81000-100000	38	31.67
>100000	14	11.67
Total	120	100.00

Source: Field survey, 2014

3.4. Factors Influencing the Amount of Informal Credit Demanded by Farmers

The result of OLS multiple regression estimates of the factors that influenced the amount of informal credit demanded by farmers in Ohafia L.G.A of Abia State, Nigeria are presented in Table 4. The functional form that best fitted the data was the exponential function. The index (R^2=0.9067) indicated that the model have provided a reasonably good estimate of the amount of informal credit demanded by farmers in the study area. The intensity of the explanatory power of the model was confirmed by the significance of the F-ratio of 42.58 at 1.0% level of probability.

Among the test variables, the coefficient (309.6089) of years of borrowing had positive relationship with the amount of informal credit demanded by the farmers in the study area and was statistically significant at 10.0% probability level. This implies that increase in years of borrowing from informal credit sources will increase the amount of credit demanded. This agrees with *a priori* expectations and much in tandem with [2, 3] that the number of years an individual has been involved in borrowing may give an indication of the practical knowledge he has gained on how to overcome the problems associated with borrowing at minimal costs. Also the consistency in borrowing and relationship developed over years with lenders would critically sort them for credit worthiness, honesty and genuineness. [27] observed that this would lead to reduction in loan delinquency and default, hence, increase in the amount of loan repayment.

The coefficient (0.566817) of household size was positive and statistically significant at 1.0% alpha level. With its

positive coefficient, it indicates that an increase in household size will increase the amount of informal credit demanded by the farmers in the study area. This result is in line with *a priori* expectation. According to [32] credit obtained by farmers with larger family sizes are likely to be spent on financing consumption and other basic household requirements than on farm production. However, this assertion is expected to hold true if a greater percentage of the household members are economic dependents.

The coefficient of age (-0.132434) was negative and statistically significant at 90.0% confidence level. The sign is in tandem with *a priori* expectation. It implies that the younger the farmer, the higher the amount of credit demanded. This result contradicts the findings of [29] that older farmers are considered better credit risks taker in the sense that they are rational decision makers and have established reputation in the community in the proper use of credit. Younger farmers are known to be entrepreneurial and economically active to explore new avenues for business opportunities [28], and thus, calls for increased credit demand.

The coefficient for interest rate (0.745283) was positively signed and statistically significant at 10.0% risk level. The implication of this result is that as interest rate increases, amount of informal credit demanded by the farmers also increases. This result is not in consistent with *a priori* expectations. The posture of this result indicates that farmers in the area had no choice than to continue to borrow informally even at higher interest rates in other to meet up with household obligations. [3] reported that interest rate plays a significant and positive role in determining the volume of credit supplied by informal credit institution. In the informal credit market, interest is paid by the borrower to encourage the creditor to forgo his potential command over current output and future investment possibilities and to cover the cost incurred in administering and possibly supervising the loan [33, 34].

3.5. Factors Affecting Informal Loan Repayment

The multiple regression model results of the factors influencing informal loan repayment in Ohafia L.G.A of Abia State, Nigeria is presented in Table 5.All the functional forms of the regression (Linear, exponential, semi-log and double log) were significant at given levels implying that any of the functional forms can be used for predictive purposes. However, informal loan repayment of the farmers was best estimated using the linear functional form, The R^2 was 0.8450 which implies that the variables in the model were able to explain 84.50 percent of the variability in loan repayment. This R^2 was high compared to 0.20 and 0.33 reported by [35] and [36] respectively for loan repayment among the smallholder clients of Nigerian Agricultural and Co-operative Bank in Osun State. The F-ratio (19.29) was significant at 1.0% level which attests to the overall correctness of the model.

Specifically, the coefficient (97262.1) of gender was negative and statistically significant at 5.0% probability level. This implies that repayment rate in informal credit sector was high among the female gender. This contradicts the findings of [37] that males tend to have a relatively better repayment performance going by their expected higher productivity capabilities in farming.

Table 4. *Multiple regression analysis result of the factors influencing amount of Informal Credit demanded by Farmers in Ohafia Local Government Area of Abia State, Nigeria.*

	Functional forms			
Independent variable	**Linear**	**Exponential+**	**Double log**	**Semi log**
Constant	241340.4***	88240.29***	-36982.7	-999377.2
	(5.33)	(4.83)	(-0.28)	(-0.33)
Years of borrowing	-343.6085	309.6089*	-26851.65	-655603.5*
	(-0.69)	(1.58)	(-1.44)	(-1.53)
Education	2129.882	1412.762	-21927.19	-511862.6
	(1.47)	(1.24)	(1.43)	(-1.25)
Farm size	14248.99**	1537.982	934.5022	20310.2
	(2.34)	(0.64)	(0.20)	(0.19)
Household size	8045.921*	0. 566817***	16646.36	392338.7
	(1.77)	(3.18)	(1.40)	(1.43)
disposable income	0.014193	0.0069573	-2330.703	-46359.55
	(0.59)	(0.74)	(-0.30)	(-0.25)
Age	3868.694	-0.132434*	-0.260692	-34828.15*
	(0.78)	(-1.96)	(0.83)	(-1.88)
Loan duration	-18455.78	0.193937	0.017075	-.302897
	(-0.45)	(0.73)	(0.12)	(1.41)
Interest rate	18577.9	0.745283*	0.004301	-23846.78
	(1.07)	(1.61)	(0.02)	(-1.19)
R square (R^2)	0.5822	0.9067	0.8255	0.8910
Adjusted R^2	0.5358	0.8741	0.8061	0.8529
F-ratio	12.54***	42.58***	23.37***	27.77***

Source: computed from Field Survey Data, 2014.

***, **,* indicate variables are significant at 1.0%, 5.0%, and 10.0% risk levels respectively.

Figures in parenthesis are the t-ratio; + =lead equation.

Table 5. *Multiple Regression Estimates of Factors that Influence informal loan repayment in Ohafia L.G.A of Abia State, Nigeria Abia state, Nigeria.*

	Functional forms			
Variable	**Linear +**	**Exponential**	**Semi-Log**	**Double-log**
Constant	11.5331***	-72588	-3251383***	0.915547***
	(15.8127)	(-0.2805)	(-2.9633)	(8.8479)
Age	-6576.5597	0.0126	0.0988	-209889.8340
	(-1.4503)	(0.03183)	(0.5423)	(-1.3613)
Gender	97262.1**	-0.2334	-0.0014	-225907.1108
	(-2.48)	(0.3102)	(-0.1111)	(-0.7207)
Educational level	25195.9901	0.8382	0.0076	223685.6031
	(0.8376)	(0.2980)	(0.3948)	(0.6971)
Farming experience	-7745.4791	14806*	0.1010*	55331.6829
	(-1.1205)	(1.8446)	(1.6119)	(0.3089)
Distance between home and sector	-4806.7824*	-5.2611***	40222.4145***	206461***
	(-1.8447)	(-134.89)	(4.0117)	(2.7240)
Amount of loan obtained	-55646.0821	0.0015	0.0000***	17697*
	(-0.8174)	(0.4545)	(0.8571)	(0.1778)
Farm size	0.0008	-0.0687	0.2432	113955.8043
	(1.1428)	(-0.6257)	(0.9747)	(0.9311)
Farm income	0.0178***	0.0803	29006.47**	-65886.9836
	(2.7937)	(0.7189)	(2.2541)	(-1.3407)
Disbursement rate	-9889.1032	-0.0002	-7710.1538	360031.5***
	(-0.6973)	(0.0027)	(-0.9719)	(7.6399)
Household size	-0.6816*	0.8472	22331.6882	-93535.0704
	(-1.9396)	(0.5825)	(0.2047)	(-0.7740)
Membership of	0.9355	0.8316***	61246.6492	161246.7741
	(0.0000)	(3.3330)	(0.8152)	(0.9207)
Interest rate	-0.05833**	0.2003	2428.731	-3282.4464
	(-2.5471)	(1.412)	(-0.48)	(-0.0204)
R^2	0.8450	0.8156	0.6983	0.7995
Adjusted R^2	0.8012	0.7542	0.6026	0.7455
F-value	19.29***	13.27***	7.30***	12.33***

Source: computed from Field Survey Data, 2014.
***, **, *: Indicate those variables are statistically significant at 1.0%, 5.0% and 10.0% risk levels respectively; Figures in parenthesis are t-ratios in the table + lead equation.

Table 6. *Calculation of Individual Variables Contribution to the Discriminant Score in Abia State, Nigeria.*

Variable	**Credit worthy mean (group 1)**	**Noncredit worthy mean (group 2)**	**Mean difference**	**Coefficient**	**Product**	**Percentage contribution**
Age	46.611	43.714	2.897	-1.541	4.464	0.033
Education	12.139	12.000	0.139	0.205	0.028	0.000205
Farming exp	17.014	15.000	2.014	1.027	2.068	0.01515
Loan period	3.083	3.714	-0.631	-0.675	0.426	0.00312
Farm income	112387.777	103425.557	8959.200	0.325	2911.740	21.329
Distance	13.250	8.857	4.393	0.951	4.178	0.0306
Gender	1.000	0.714	0.286	0.688	0.197	0.00144
Farm size	2.104	2.214	-0.110	0.091	0.010	0.00007
Amount borrowed	150,133.88	251,428.566	-101,289.6	-0.106	10736.700	78.650

Source: computed from Field Survey Data, 2014.
Group Centroids: Credit worthy 0.300; Non-credit worthy -0.114
Cut off point 0.212

Distance between dwelling place of clients and informal credit sector coefficient (-14806.7824) was inversely related to informal loan repayment and was statistically significant at 90.0% confidence level. This is not contrary to a *priori* expectation and indicates that the clients are living in community accessible to the informal credit sector. On the other hand, the credit sector may not encounter difficulty or incur more cost in following up clients in remote communities for loan recovery. However, the nearer a client was to a credit sector, the better the repayment rate.

The result also shows that informal loan repayment of the farmers was sensitive to Household size. The coefficient of this variable (-0.6816) was statistically significant at 10.0% alpha level, and negatively signed. The negative sign of the coefficient conforms to *a priori* expectation and implies that the higher the family size, the lower the amount repaid. Also this indicates that farmers with moderate family sizes repaid large amount of informal loan. This result is in agreement with [32] who posited that farmers with relatively larger household sizes are more likely to spend more of the

acquired loans on financing consumption and other basic house hold requirements than on farm production and loan repayment. However, this assertion is expected to hold if the farmer's household members are mostly economic dependents.

The coefficient of interest rate (-0.05833) was negative and significant at 5.0% level of significance. Holding other factors constant, this implies that the lower the interest rate charged, the higher the amount of loan repaid. This result is consistent with *a priori* expectations. [3, 38] reported that interest rate played a significant and negative role in determining the volume of credit repaid.

The coefficient (0.0178) of farm income made positive contribution to the equation and was statistically significant at 1.0% probability level. This implies that the richer the farmers (increased farm income), the higher the repayment of borrowed funds. This implies that poverty reduced the rate of informal loan repayment among borrowers. This result is in line with *a priori* expectation.

3.6. Loan Repayment Potentials

In estimating loan repayment performance of the beneficiaries, the linear discriminant function analysis was employed and the result is presented in Table 6. The objective here is to classify the farmers as either credit worthy or non-credit worthy based on their repayment rates and to evaluate the discriminatory powers of the independent variables involved. The cut-off point for the purpose of classification was taken as the mid-point of total discriminant score for each group because discriminant function analysis itself assumes equal cost of misclassification [25].

Initially, the grouping of farmers was divided into two, based on the rate of loan repayment. Those whose loan repayment rate were greater than or equal to 50 percent (U≥50) were assigned to group one, while the farmers who repaid below 50 percent (U< 50) were assigned to group two based on the criteria. 84 farmers were found to be relatively credit worthy (group one) while the remaining 36 were relatively noncredit worthy (group two).

It could be observed that all the variables made varied contribution to the loan repayment performance. Education, farming experience, farm income, distance between home and loan source, gender and farm size made positive contribution to the total discriminant score while age, loan period and amount borrowed contributed negatively. By implication, the chances of the beneficiaries to belong to the group of credit worthy category are enhanced by the variables with positive coefficient signs. This is consistent with previous studies [29, 39]. In terms of magnitude of contribution as shown in Table 6.0, amount borrowed and farm income made the most significant contributions to the total discriminant score to the tune of 79% and 21% respectively. The implication is that these variables should be given optimum consideration in determining loan applicants' credit worthiness potentials in the area.

The estimated group centroid for credit worthy farmers was 0.300 while that of non-credit worthy beneficiaries was -0.114. This means that the higher the composite score of any farmer informal borrower, the higher the probability that the farmer will be classified as being credit worthy and vice versa.

The group means and difference in mean between the credit worthy and non-credit worthy farmers are also presented in Table 6.0. [40] opined that if there are no significant group mean differences, it is not worthwhile proceeding further with the analysis. However, from the Table it could be inferred that there were significant group differences. For instance the large mean differences between farm income in group 1 and farm income in group 2 and also between amount borrowed in group 1 and amount borrowed in group 2 suggest that these may be good discriminators as the separations are large. The study therefore proceeded to test overall model fit and significance, given the high mean differences between some variables in Table 6.0.

Table 7. *Statistical Test of Significance for the Discriminate Function Coefficient.*

Test of function	
Eigen value	3.244
Canonical correlation	0.714
Wilks lambda	0.391
Chi square	66.198
Df	10
Significance level	0.000***

Source: Computed From Field Survey Data, 2014
*** = statistically significant at 1.0% probability level

3.7. Statistical Test of Significance

The statistical test of significance of the estimated function is presented in Table 7. The Table indicates that the Eigen value of the model is 3.244, which is high. A low Eigen value is an indication of near linear dependencies in the data [40]. Hence, there is no room for problem of multi-collinearity. The Table also shows a relatively high canonical correlation coefficient of 0.714 and low Wilks' Lambda of 0.491. This indicates that the discriminant function used in this study provided the high significant amount of information required for classification of farmer borrowers into credit worthy and non-credit worthy groups. Its significant level was shown by the chi-square statistic of 66.198. The low Wilks' Lambda (0.391) indicates that the model provided high significant amount of information required for classification of the farmers into credit worthy and non-credit worthy groups. This result compares favourably with [40] where a canonical correlation coefficient of 0.870 and Wilks' Lambda value of 0.243was obtained.

3.8. Classification Performance of the Estimated Discriminate Function

Table 8 shows how well the function performed in classifying the loan beneficiaries.

The function was predicted using a sample of 120 informal loan beneficiaries. Given that the power of the model lays in

its capacity to classify correctly, then the higher the rate, the better is the predictive power of the function. With respect to the repayment rate, it was found that out of the 120 informal loan beneficiaries, 76 farmer borrowers which constitute 90.48% were classified as credit worthy contrary to the initial classification which saw 84 farmers to be relatively credit worthy based on the use of loan repayment rate. Also the model found 28 farmer borrowers to be non-credit worthy as against the initial number of 36 farmers, who, based on repayment rate were found to be relatively non-credit worthy. The proportion of credit worthy farmers erroneously classified as being non-credit worthy formed about (22.22%) of the 36 non-credit worthy farmers subjected to classification. On the other hand the proportion of non-credit worthy farmers erroneously classified as being credit worthy formed about (9.52%) of the 84 credit worthy farmers subjected to classification. These kinds of error constitute the greatest risk in agricultural credit administration. Whereas the 22.22% credit worthy farmers erroneously classified as being non-credit worthy will affect interest earnings foregone, the 9.52% non-credit worthy farmers may default in the payment of interest as well as the principal loans. This result is in conformity with the findings of [25, 29] that had different prediction of group membership after the application of the model.

The totality of both may be high enough to reduce the amount of loan fund available for subsequent operations. Misclassification errors may lead eventually to loan shrinkage, ineffectiveness and liquidation. The classification performance of the function was 84.13%.

Table 8. *Classification performance of the estimated discriminate function.*

Actual group	No of cases	Predicted1	Group membership2
Group 1			
Credit worthy	84	76 (90.48%)	8 (9.52%)
Group 2			
Non-Credit worthy	36	8 (22.22)	28 (77.78)

Source: Computed from Field Survey data, 2014
Percentage of actual grouped cases correctly classified 84.13%

3.9. Problems of Informal Credit Demand

In spite of the achievements of the various informal credit sectors, it is clear, that more problems of informal credit demand have evolved in past years. The problems encountered have demonstrated to policy makers and those involved in policy implementation the direction in which the various informal credit institutions should move in the future.

The result in Table 9 shows that majority (85.0%) of the respondents faced problem of high interest rate as a constraint to informal credit demand. A study by [41] had earlier reported that, money lenders generally charged exorbitant rates due to risks involved and in some cases they extract economic surplus provided by peasant labour, capital and possibly land. The Table also shows that 61.67% of the respondents complained that non-institution financial agents tend to be small and proprietary in size, confine activities to small neighbourhoods, and restrict activities to only well-known people in order to avoid default. Thus, non-institutional sources of credit can only cater for a limited number of trusted clients. Meanwhile a very good proportion of the respondents encountered the problem of small volume of lending in informal credit sector. This supports the findings of [6] that the volume of lending in informal credit sector is very small and may not meet the needs of the borrower. Also, 71.67% of the farmers reported that adoption of third party guarantees as a technique of overcoming problem of collateral is defective in that enforceability is difficult and ineffective.

Furthermore, 66.67% of the borrowers had problem of collateral as their major problem in demanding for loan from the institution while some informal credit sector require those borrowers to deposit 10% of the loan amount. Physical assets that the lender can seize if the borrower defaults are usually hard to come by in the rural areas partly because the borrowers are too poor to have assets that could be collateralized, and partly because poorly developed property rights make appropriating collateral in the event of default difficult in rural areas.

Table 9 also shows that 48.33% of the respondents encountered the problem of short repayment period. Loans are not synchronized with periods of harvest. Meanwhile 40.0% of the respondents indicated that one of their teething problems was the long distance between their homes and source of credit. This increases the borrowing costs on the parts of the borrowers. Similar result is documented by [42].

Table 9. *Distribution Constraints of informal credit demand by farmers in Ohafia L.G.A of Abia State, Nigeria.*

Problem	Frequency*	Percentage*
High interest rate	102	85.00
Collateral security	80	66.67
Long distance	48	40.00
Short repayment period	58	48.33
Small financial agents and proprietary size	74	61.67
Small volume of lending	90	75.00
Problems *of* third party guarantees	86	71.67

Source: Field Survey, 2014
*Multiple responses recorded

4. Conclusions and Recommendations

From the foregoing results, the following conclusions are deduced: Funds were rationed among the numerous successful applicants due to gross shortage of loanable funds; hence total amount received was less than total amount applied by the farmers. Farmer's loan repayment performance was relatively high in the study area. The

factors that influenced the amount of informal credit demanded by farmers in the study area were years of borrowing, household size, age and interest rate. The factors that influenced informal loan repayment in the study area were gender, distance between home and source of credit, household size, interest rate and farm income.

Meanwhile education, farming experience, farm income, distance between home and loan source, gender and farm size made positive contribution to the total discriminant score while age, loan period and amount borrowed contributed negatively. A good number of the farmers were found to be relatively credit worthy while a few were relatively non-credit worthy. The major constraint to informal credit demand in the study area was high interest rate

Based on the findings of this study and conclusions drawn, a number of policy implications and recommendations are made: The problem of high interest rate of informal credit institutions should be looked upon and addressed by the government. This will enable the indigent farmers to access and patronize informal credit institutions available to them.

Informal credit institutions in the area disbursed substantial amount of credit to beneficiaries. Therefore, policy makers interested in improving the living conditions of households are advised to consider promoting informal credit associations as one relevant ingredient to achieve the Millennium development goals of reducing poverty by half through granting access to credit.

Informal financial institutions should ensure timely disbursement of loans to young, experienced and better educated farmers who are more likely to utilize resources efficiently, and repay loans promptly. Majority of the respondents encountered the problem of short repayment period. Informal credit institutions should therefore synchronized loans with periods of farm harvest.

It is evident from the study that the study area is still under banked. It is also recommended that more informal credit sectors should be positioned in the rural areas accessible to rural farmers. This will reduce borrowing costs on the parts of the borrowers.

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